

IN THE CLAIMS

Please amend the claims as follows:

Claims 1-7 (Cancelled).

Claim 8 (Currently Amended): A magnetoresistive element, comprising:
a magnetoresistive film; and
a pair of electrodes electrically connected to upper and lower surfaces of the magnetoresistive film, respectively, so as to flow a sense current in a direction substantially perpendicular to a plane of the magnetoresistive film,
in which the magnetoresistive film comprises:
a first magnetization free layer of a ferromagnetic film whose magnetization direction is changed in response to the external magnetic field,
a second magnetization free layer of a ferromagnetic film whose magnetization direction is changed in response to the external magnetic field,
a first magnetization pinned layer of a ferromagnetic film whose magnetization direction is substantially pinned in one direction,
a second magnetization pinned layer of a ferromagnetic film whose magnetization direction is substantially pinned in one direction,
a first nonmagnetic intermediate layer formed between the first magnetization free layer and the first magnetization pinned layer, and
a second nonmagnetic intermediate layer formed between the second magnetization free layer and the second magnetization pinned layer,
the first magnetization pinned layer and the second magnetization pinned layer being formed between the first nonmagnetic intermediate layer and the second nonmagnetic intermediate layer;

the pinned direction of magnetization of a ferromagnetic layer included in the first magnetization pinned layer which is in contact with the first nonmagnetic intermediate layer ~~is being~~ substantially antiparallel to the pinned direction of magnetization of a ferromagnetic layer included in the second magnetization pinned layer which is in contact with the second nonmagnetic intermediate layer, and the magnetization of each of the first magnetization pinned layer and the second magnetization pinned layer ~~is being~~ pinned by exchange coupling with one antiferromagnetic layer.

Claim 9 (Original): The magnetoresistive element according to claim 8, wherein one of the first magnetization pinned layer and the second magnetization pinned layer is formed of a single ferromagnetic layer or is formed of a stack of an odd number of ferromagnetic layers and nonmagnetic layers, and the other magnetization pinned layer is formed of a stack of an even number of ferromagnetic layers and nonmagnetic layers.

Claim 10 (Original): The magnetoresistive element according to claim 8, wherein the pair of electrodes electrically connected to upper and lower surfaces of the magnetoresistive film, respectively, provides a differential output.

Claim 11 (Original): The magnetoresistive element according to claim 8, wherein a gap between the first and second magnetization free layers ranges from 1 nm to 50 nm.

Claim 12 (Original): The magnetoresistive element according to claim 8, wherein at least one layer of the first and second nonmagnetic intermediate layers contains an oxide.

Claim 13 (Original): The magnetoresistive element according to claim 12, wherein the nonmagnetic intermediate layer containing the oxide has a thickness ranging from 0.5 nm to 5 nm.

Claims 14-15 (Cancelled).

Claim 16 (Original): A magnetic head comprising the magnetoresistive element according to claim 8.

Claim 17 (Original): A magnetic recording/reproducing apparatus, comprising:
the magnetic head according to claim 16; and
a perpendicular magnetic recording medium.

Claim 18 (New): A magnetoresistive element, comprising:
a magnetoresistive film; and
a pair of electrodes electrically connected to upper and lower surfaces of the magnetoresistive film, respectively, so as to flow a sense current in a direction substantially perpendicular to a plane of the magnetoresistive film,
in which the magnetoresistive film comprises:
a first magnetization free layer of a ferromagnetic film whose magnetization direction is changed in response to the external magnetic field,
a second magnetization free layer of a ferromagnetic film whose magnetization direction is changed in response to the external magnetic field,
a first magnetization pinned layer of a ferromagnetic film whose magnetization direction is substantially pinned in one direction,
a second magnetization pinned layer of a ferromagnetic film whose magnetization direction is substantially pinned in one direction,
a third magnetization pinned layer of a ferromagnetic film whose magnetization direction is substantially pinned in one direction,

a fourth magnetization pinned layer of a ferromagnetic film whose magnetization direction is substantially pinned in one direction,

a first nonmagnetic intermediate layer formed between the first magnetization free layer and the first magnetization pinned layer,

a second nonmagnetic intermediate layer formed between the first magnetization free layer and the second magnetization pinned layer,

a third nonmagnetic intermediate layer formed between the second magnetization free layer and the third magnetization pinned layer, and

a fourth nonmagnetic intermediate layer formed between the second magnetization free layer and the fourth magnetization pinned layer,

the second magnetization pinned layer and the third magnetization pinned layer being formed between the second nonmagnetic intermediate layer and the third nonmagnetic intermediate layer;

the pinned direction of magnetization of the first magnetization pinned layer is substantially parallel to the pinned direction of magnetization of the second magnetization pinned layer, the pinned direction of magnetization of the third magnetization pinned layer is substantially parallel to the pinned direction of magnetization of the fourth magnetization pinned layer, and the pinned direction of magnetization of the second magnetization pinned layer is substantially antiparallel to the pinned direction of magnetization of the third magnetization pinned layer.

Claim 19 (New): The magnetoresistive element according to claim 18, wherein, when the magnetization pinned layers are classified into two sets consisting of a first set of the first magnetization pinned layer and the second magnetization pinned layer and a second set of the third magnetization pinned layer and the fourth magnetization pinned layer, each of the magnetization pinned layers for one set is formed of a single ferromagnetic layer or is formed of a stack of an odd number of ferromagnetic layers and nonmagnetic layers, and

each of the magnetization pinned layers for the other set is formed of a stack of an even number of ferromagnetic layers and nonmagnetic layers.

Claim 20 (New): The magnetoresistive element according to claim 18, wherein, the magnetization of the first magnetization pinned layer is pinned by exchange coupling with a first ferromagnetic layer; the magnetization of each of the second magnetization pinned layer and the third magnetization pinned layer is pinned by exchange coupling with a second antiferromagnetic layer; and the magnetization of the fourth magnetization pinned layer is pinned by exchange coupling with a third antiferromagnetic layer.

Claim 21 (New): The magnetoresistive element according to claim 18, wherein the pair of electrodes electrically connected to upper and lower surfaces of the magnetoresistive film, respectively, provides a differential output.

Claim 22 (New): The magnetoresistive element according to claim 18, wherein a gap between the first and second magnetization free layers ranges from 1 nm to 50 nm.

Claim 23 (New): The magnetoresistive element according to claim 18, wherein at least one layer of the first to fourth nonmagnetic intermediate layers contains an oxide.

Claim 24 (New): The magnetoresistive element according to claim 23, wherein the nonmagnetic intermediate layer containing the oxide has a thickness ranging from 0.5 nm to 5 nm.

Claim 25 (New): A magnetic head comprising the magnetoresistive element according to claim 18.

Claim 26 (New): A magnetic recording/reproducing apparatus, comprising:
the magnetic head according to claim 25; and
a perpendicular magnetic recording medium.